in certain significant germinal factors. Thus if *A* is sterile with *B* and *C*, *B* will be sterile with *C*. Shifting now[8] to the physiological technique, they discover that sterility is tied up with the rate of pollen-tube growth. In cases of selfing or cross-sterile pollinations, the pollen not only germinates successfully but develops a normal pollen tube. This tube grows through the style at a uniform rate, but fails to reach its goal before the flower decays. In cases of cross-fertility the pollen tube grows at a progressively increasing rate. The logical conclusion is that self-sterility is not due to the presence of inhibiting substances, but rather to the absence of accelerating substances (catalyzers produced by the pollen-tube nucleus in compatible crosses, and only local in their effect). At the wane of the flowering period self-sterility and cross-sterility may be replaced by "pseudo-fertility." This is explained by the breaking down of the stylar tissue, so that own pollen tubes grow at a uniformly greater (not accelerated) rate.—MERLE C. COULTER.

Photometry.—The probability that a solution of uranium acetate and oxalic acid may be used successfully as a chemical photometer in physiological researches involving the measurement and comparison of light intensities is indicated by some experiments by RIDGWAY.[9] The solution used consisted of 1 per cent uranium acetate and 5 per cent oxalic acid in aqueous solution mixed in the proportion of 1:4. In various tests designed to compare the oxalic-acid–uranium-salt photometer with the Callendar pyrheliometer, the chemical photometer gave results in general agreement with the pyrheliometer, even though the 2 instruments involve different portions of the solar spectrum. If the instrument and methods of using the solution can be reliably standardized, the inexpensiveness of the materials, ease of taking readings, accuracy of determinations, and its automatic integration for variable conditions of light during exposure will make it an excellent instrument for extending our knowledge of the influence of light as related to life processes in plants and animals.—C. A. SHULL.

Nitrogen fixation.—Another contribution from the Missouri Botanical Gardens on the subject of nitrogen fixation by lower organisms deals with the growth of *Azotobacter* in synthetic media. ALLEN[10] believes that most of the discrepancies in the results of previous investigators can be explained on the basis of the phosphorus requirements of the organism and the reaction of the medium. He proves this in a fairly satisfactory way by means of the following factors: (1) when $CaCo_3$ is used to maintain a proper P_H in the media, the

[8] EAST, E. M., and PARK, J. B., Studies on self-sterile plants. II. Pollen-tube growth. Genetics 3:353–366. *figs.* 3. 1918.

[9] RIDGWAY, CHARLES S., A promising chemical photometer for plant physiological research. Plant World 21:234–240. 1918.

[10] ALLEN, E. R., Some conditions affecting the growth and activities of *Azotobacter chroococcum*. Ann. Mo. Bot. Gard. 6:1–44. 1919.